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found out under the waves, by consolidation and depression as the barrier beach worked over them, describing a place where wagon tracks occurred. Of course, Professor Johnson does not deny that there has been subsidence and peat formed at lower levels, but probably several thousand years ago.

After dinner Professor Lane took charge of one party (while others studied the peat) and showed typical gabbro and various diabase dikes. He called attention to the basaltic columnar structure of some of these dikes and also a jointing which enabled one to obtain the dip of the main gabbro mass itself. Bass Beach and Canoe Beach both offered excellent opportunity to see the beach scallops in formation. Passing on to Pulpit Rock the finer grain of the gabbro near the contact was noticed and its contact with siliceous and argillaceous limestones changed to epidote and garnet rocks and black basanite. Some of the party found Hyolithes while others passing back along the north shore of the island had a good chance to observe the differentiation of the gabbro into a salic or syenitic phase (which Professor Lane called a gabbro aplite) and a dark peridotite phase near Black Mine. There were numerous other points of interest which attracted some of the crowd (which gradually dispersed) such as faults and the comparison of the rounding of the pebbles with those of the overwash gravel plain.

E. H. & A. C. L.

SPECIAL ARTICLES

A NEW MINNOW FROM COLORADO

A SMALL fish collected by Mr. Horace G. Smith at Julesburg, Colo., has been the occasion of much correspondence and discussion, but may now be brought forward as apparently undescribed.

Notropis horatii n. sp.

Type. Length 58 mm., to base of caudal 47; depth 9 mm., width $5\frac{1}{2}$; D. 8, A. 9; scales 5 or 6—38 to 40—4; dorsal region clear ferruginous, with a fine dusky band; a rather broad lateral silvery band; scales of lateral

line with little dark spots, as in *N. telescopus*; fins yellowish-white, no spot on dorsal or caudal; front of dorsal to base of caudal 24 mm., to end of snout 23; dorsal fin beginning a little anterior to level of pelvic; region before dorsal not bare of scales. Scales with 9 apical radii.

This was supposed to be *N. piptolepis* (Cope) or *N. gilberti* Jordan & Meek, these two names being considered by Drs. Evermann and Kendall probably synonymous. At the U. S. National Museum I found the type of *N. gilberti*, which proves to be very distinct, as follows:

1. *N. gilberti*, type. Diameter of eye 3.9 mm., snout beyond eye 3; depth of head 7.35 mm.; snout to base of caudal 39; beginning of dorsal level with beginning of ventral; no dark dorsal band; ventral scales exceedingly broad.

2. *N. horatii*, type. Diameter of eye 3, snout beyond eye 3.4; depth of head 6.35 mm.; snout to base of caudal 45.5; beginning of dorsal in front of beginning of ventral; a dark dorsal band; ventral scales ordinary.

Both have a silvery lateral band; the dorsal area of *gilberti* is darker and redder. The dorsal profile of head and anterior part of body in *horatii* is practically flat. The corners of the mouth in *horatii* are a little anterior to the level of front of eye.

The question now arises whether the fish can be *N. piptolepis*, to which it runs in my table of Colorado Cyprinidae (Univ. of Colo. Studies, Vol. V., No. 3). The type of *piptolepis* seems to be lost, as it was not found at the National Museum, and Fowler does not list it in his account of the species in the collection at Philadelphia. Possibly the name may have to be given up as undeterminable, but we have a mason-jar full of a species collected in Boulder Creek by Juday, recorded by him as *piptolepis* and accepted as such by me. This fish is certainly quite distinct from *horatii*, and I believe it to be Cope's species. Although *N. horatii* is doubtless of the immediate alliance of *piptolepis* and *gilberti*, it is superficially very like *N. stellatus* and *N. telescopus*, in another group. The species is

named after Mr. Horace G. Smith, of Denver, who has long studied the fauna of Colorado, and who went to great trouble to revisit the locality and obtain additional material. The other Cyprinids found by Mr. Smith at Julesburg were *Semotilus atromaculatus macrocephalus* (Girard) and *Phenacobius scopifer* (Cope).

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A BACTERIAL GUMMOSIS OF CHERRIES

CERTAIN varieties of the cultivated sweet cherries grown in the Pacific northwest are very subject to a diseased condition which is commonly known as "cherry gummosis." The disease is characterized by more or less copious exudation of gum from the trunk, branches, spurs and buds as well as by a pustulated appearance of the bark near the diseased areas. Often but little gum is exuded, but in such cases an examination of the affected trees generally discloses discolored tissues which is infiltrated with gum. Such areas are spongy to the touch and are usually discernible by the variation in color of the bark as compared with that of the normal.

Gummosis is found in every cherry growing section of Oregon, but it is in the more humid portion of western Oregon that its prevalence and destructiveness gives it the rank of a major disease, and where its appearance in an orchard is most dreaded by the grower.

Cherry gummosis appeared soon after the first planting of cherries in the state. Its prevalence has varied from season to season, being apparently more abundant in those years when the trees experienced rather sudden extreme variations in temperature after growth had started. This has led observing growers to attribute the trouble chiefly to the climatic factor. The disease appears on a wide range of soil, but the trees growing in the more exposed locations or on poorly drained or shallow soil are generally the worst affected.

Cherry gummosis appears in both a localized and generalized form. In the former, the

disease is apparently confined to rather limited areas on the trunk or branches, such areas being most often associated with a blighted spur or bud. In the generalized form, large areas of the trunk or branch may become involved, and it often results in complete girdling. This latter type of gummosis often appears to originate in the crotch of the tree.

The writer was assigned the problem of investigating the possible causes and prevention of cherry gummosis while a student in the Oregon Agricultural College. In the spring of 1909, I noted bacteria in sections of blighted cherry fruit spurs, and upon making cultures from fresh material, found the organisms to be rather constantly associated with such diseased spurs. I had to drop the investigation for the time being on account of the stress of other work, but from the few direct inoculations made into healthy spurs a blighting or gumming occurred.

In the spring of 1910 a large number of cultures were made from material procured in different cherry-growing sections. In the agar plates resulting from such cultures, one type of organism seemed to predominate, and it often appeared in pure culture. From pure cultures thus obtained a series of inoculation experiments were made in which the organisms were transferred from agar slants to healthy fruit spurs by needle pricks. The spurs thus inoculated, blighted or gummed, while the checks healed without blighting or gumming. The typical organism was re-isolated from the inoculated spurs and again inoculated into other healthy fruit spurs. These inoculated spurs again blighted and gummed while the checks remained normal.

During the present season the work has been continued, and several series of inoculations have been made with different strains of the organism. As a result of these inoculations and reinoculations in which I have tried to follow implicitly the Rules of Proof of Pathogenicity as found in Smith's "Bacteria in Relation to Plant Diseases," I believe I have found a specific cause of at least one form of cherry gummosis.